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Efficient and Sustainable Production: A Stochastic Frontier Analysis of Technical Efficiency among Coffee Farmers in Daklak, Vietnam

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Abstract

The explosive growth of Vietnam's coffee sector has been explained as the result of government direct intervention, agricultural liberalisation, and favourable conditions in the coffee world market. The sector has brought positive impacts on the creation of employment, economic growth, public finance, income distribution, and regional development. However, most coffee plantations in Vietnam are small-scale operations that do not allow farmers to benefit from economies of scale as well as increase productivity and efficiency. Although many coffee farmers have recently adopted sustainable coffee production (SCP) practices, they still have struggled with water scarcity, pest and disease, increased cost of inputs in the domestic market as well as international price volatility.

This study adopts stochastic frontier approach to examine the production elasticity coefficients of inputs, technical efficiency and the factors affecting the technical efficiency between SCP and non-SCP coffee farmers in Daklak. A sample of 316 smallholder coffee producers in three different regions of Daklak (Krongpak, CuMgar, and Buon Ho) were selected. These regions are key coffee planting areas in Daklak. The results show that irrigation, fertiliser, seedling, labour, as well as the plantation area are the major factors associated with changes in coffee output. Factors influenced technical efficiency including gender, ethnic, education level, farm size, adoption of SCP, and farming region were found to be significant at different level. Average technical efficiency score of sampled coffee farmers was estimated to be 0.38. SCP coffee farmers achieved higher technical efficiency score meaning SCP practices were more technically efficient. The results suggest that strengthening participation in SCP is important for increasing technical efficiency of smallholder coffee farmer in Daklak.

Keywords: Stochastic frontier, sustainable coffee production, Technical efficiency

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